REMARKS

Claims 1-87 are pending. Claims 1-4, 6-7, 19, 27-29, 33-34, 36, 43, 49, 59, 68-69, 76, 78, 84 and 86 are amended to more particularly point out and distinctly claim Applicants' invention.

The Examiner objected to the Specification because the references to co-pending application did not include their respective serial numbers. As amended, the Examiner's objection is believed overcome.

Claim objections

The Examiner objected to informalities in the claims. Except as noted in the following, all the informalities are corrected. Not all the Examiner's suggested corrections are made because:

(a) the Examiner's objections with respect to Claim 2, lines 12, 16, 46, 48-49, 51 and 58, are believed incorrect;

(b) the Examiner's objections with respect to Claim 59, lines 22 and 26, are believed incorrect;

(c) the Examiner's objections with respect to Claim 76, lines 2 and 7, are believed incorrect; and

(d) the Examiner's objection with respect to Claim 86, line 2, is believed incorrect.

Objection to the Drawings and Rejection of Claims under 35 U.S.C. § 112, first paragraph

The Examiner objected to the drawings, stating that the method steps recited in Claims 4, 7 and 59 are not shown. Based on substantially the same basis, the Examiner rejected Claims 4-18 and 59-87 under 35 U.S.C. § 112, first paragraph, as failing to comply with the

Serial No. 09/888,227

written description requirement. The Examiner states that Claims 4, 7 and 59 do not recite the steps illustrated by Figs. 2A and 2B.

Applicants respectfully traverse the Examiner's objection to the drawings and the Examiner's rejection of Claims 4-18 and 59-87. With respect to Claim 4, the corresponding steps in Figs. 2A and 2B are set forth in the following table:

Claim 4	Support in Figs 2A and 2B
step A: defining a first set of frequencies and a second set of frequencies;	Steps 200 and 204
step B: defining a first set of data blocks and a second set of data blocks, wherein; each set of data blocks make up the sampled data;	Step 206
step C: defining a first pair of data block-frequency set, wherein: the first pair of data block-frequency set comprises the first set of data blocks and the first set of frequencies;	Steps 206, "corresponding to the coarse grain frequency bins"
step D: defining a second pair of data block-frequency set, wherein: the second pair of data block-frequency set comprises the second set of data blocks and the second set of frequencies;	Steps 204 and 206
step E: selecting the first pair of data block-frequency set;	Step 210
step F: for each data block in the first pair of data block-frequency set, calculating a pair of I and Q correlation integrals at each frequency in the first pair of data block-frequency sets to produce a corresponding pair of I and Q correlation values;	Step 220
step G: from the second pair of data block-frequency set, selecting one data block that has not been previously selected from the second pair of data block-frequency sets to be a selected data block and performing the steps of:	Step 222, selecting a hypothesized delay value.
step H: from the first pair of	Step 222, identifying all data blocks

LAW OFFICES OF
MacPherson, Kwok, Chen &
Heid LLP
1762 Technology Drive, Suite 226
San Jose, CA 95110
(408)-392-9520
FAX (408)-392-9262

Serial No. 09/888,227

data block-frequency set, identifying a subset of data blocks that make up the selected data block;	corresponding to the selected "hypothesized delay value."
step I: selecting a frequency that has not been previously selected from the second pair of data block-frequency set to be a target frequency;	Step 222, taking a frequency "in each fine grain frequency bin" one by one
step J: from the first pair of data block-frequency set, identifying a frequency that is close in value to the target frequency to be an identified frequency;	Step 222, finding a frequency in the first data-block frequency set, so that the corresponding I and Q correlation sums can be identified, in order to achieve "without re-calculating I and Q correlation sums".
step K: selecting pairs of I and Q correlation values that correspond to the subset of data blocks from the first pair of data block-frequency set to be the selected pairs of I and Q correlation values;	Step 222, implemented using the steps 840 and 850 of Figure 6, which are described on page 31, lines 6-16.
step L: for the selected data block, weighting the selected pairs of I and Q correlation values with weights to form weighted pairs of I and Q values;	Step 222, "Sum I AND Q correlation blocks"
step M: summing the weighted pairs of I and Q values over the selected data block to form weighted sums of I and Q values; and	Step 222, continue to "Sum I and Q correlation blocks over all the data blocks"
step N: repeating steps I through N until all the frequencies from the current pair of data block-frequency sets have been selected to be the target frequency; and	Step 222, repeatedly choosing frequencies until all frequencies in all "fine grain frequency bins" are processed.
step O: repeating steps G through O until all the data blocks from the second pair of data block-frequency set have been selected to be the selected data block.	Step 222, repeating steps G to O to process all hypothesized delay values.

Similarly, with respect to Claim 7, the corresponding steps in Figs. 2A and 2B are set forth in the following table:

Serial No. 09/888,227

Claim 7	Support in Figs. 2A and 2B
receiving sampled data associated with a received signal; dividing a range of frequency of interest into a first set of frequency intervals and a second set of frequency intervals;	Step 204
dividing the sampled data into a set of data blocks based on the first set of frequency intervals;	Step 206
for each data block of the set of blocks of data, calculating I and Q correlation integrals associated with the sampled data at one representative frequency from each frequency interval in the first set of frequency intervals;	Step 220
for every frequency interval of the second set of frequency intervals, determining a selected frequency in the first set of frequency intervals, wherein the selected frequency is close in value to the target frequency;	Step 222, identifying the suitable frequency in the first frequency interval, whose I and Q correlation sums can be reused (i.e., "without recalculating I and Q correlation sums).
selecting I and Q correlation integrals corresponding to each selected frequency to be a selected pair of I and Q correlation values;	Step 222, selecting the corresponding "I and Q correlation sums"
weighting the selected pairs of I and Q correlation values according to a set of characteristics to produce a set of weighted pairs of I and Q correlation values; and	Step 222, preparing the I and Q correlation for summing "over all hypothesized delay value" properly. (This step is inherent in "without re-calculating I and Q correlation sums")
summing the weighted pairs of I and Q correlation values at the target frequency.	Step 222, "[summing] I and Q correlation sums over all data blocks."

Similarly, with respect to Claim 59, the corresponding steps in Figs. 2A and 2B are set forth in the following table:

Claim 59	Support in Figs. 2A and 2B
receiving data associated with a received signal;	Inherent step that prepares the "sampled signal" in Step 206

LAW OFFICES OF
MacPherson, Kwok, Chen &
Heid LLP

1762 Technology Drive. Suite 226
San Jose, CA 95110
(408)-392-9520
FAX (408)-392-9262

-30-   Serial No. 09/888,227

Determining a frequency range of interest;	Step 202
Determining a set of coarse frequencies within the frequency range of interest;	Step 204 (i)
determining a set of fine frequencies within the frequency range of interest;	Step 204 (ii)
dividing the data into a set of data blocks;	Step 206
for each data block of the set of data blocks, calculating I and Q correlation values associated with the data at each frequency from the set of coarse frequencies;	Step 220
for every frequency of the set of fine frequencies, determining a selected frequency in the set of coarse frequencies, wherein the selected frequency is close in value to the frequency in the set of fine frequencies;	Step 222, identifying a coarse frequency close to each of the fine frequencies, so as to identify the correlation sums that can be reused (i.e., "without re-calculating I and Q correlation sums").
for each data block of the set of data blocks, selecting I and Q correlation values corresponding to each coarse frequency to be the selected I and Q correlation values for the corresponding data block and coarse frequency;	Step 222, select I and Q correlation sums corresponding to the coarse frequency identified.
selecting weights for the selected I and Q correlation values, based on a difference of between a frequency in the set of fine frequencies and the corresponding selected frequency in the set of coarse frequencies, and also based on a position of the data block that corresponds to the selected pair of I and Q correlation values;	Step 222, determining how to prepare the I and Q correlation for summing "over all hypothesized delay value" properly.
weighting the selected pairs of I and Q correlation values according to the selected weights to produce weighted pairs of I and Q correlation values;	Step 222, applying "the I and Q correlation for summing "over all hypothesized delay value" properly. (This step is inherent in "without re-calculating I and Q correlation sums")
computing an approximation to the I and Q correlation integrals over the entire data associated with the received signal, for each frequency in the set of fine frequencies, using the weighted pairs of I and Q correlation values; and	Step 222, "[summing] I and Q correlation sums over all data blocks"

Serial No. 09/888,227

estimating the carrier frequency from within the set of fine frequencies by using the approximations to the I and Q correlation integrals at the frequencies in the set of fine frequencies.	Steps 880 and 950 of Figure 1B.

Thus, since Claims 4, 7 and 59 are each supported by the drawings and the Specification, Applicants respectfully submit that the Examiner's objection to the drawings is erroneous and Claims 4, 7 and 59 and their respective dependent Claims 4-6, 8-18 and 60-87 fully comply with 35 U.S.C. § 112, first paragraph.

Rejection of Claim under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected Claim 6 under 35 U.S.C. § 112, second paragraph, as being indefinite. As amended, Claim 6 now depends from Claim 4, and thus the Examiner's rejection is believed overcome.

Conclusion

For the above reasons, Applicants believe that all claims (i.e., Claims 1-87) are allowable. If the Commissioner has any questions, the Commissioner is respectfully requested to telephone Applicants' attorney at (408) 392-9250.

Respectfully submitted,
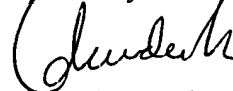
Edward C. Kwok
Attorney for Applicants
Reg. No. 33,938

LAW OFFICES OF
MacPherson, Kwok, Chen &
Heid LLP
1762 Technology Drive, Suite 226
San Jose, CA 95110
(408)-392-9520
FAX (408)-392-9262